NJDOT Bureau of Research
QUARTERLY PROGRESS REPORT

Project Title:	Technology Transfer 2005		
RFP NUMBER: NA		NJDOT RESEARCH PROJECT MANAGER: Nick Vitillo	
TASK ORDER NUMBER:: RF-CUNY 26		PRINCIPAL INVESTIGATOR: Robert Paaswell	
Project Starting Date: 01-01-05 Original Project Ending Date: 12-31-05 **Modified Completion Date:**		Period Starting Date: 7-01-05 Period Ending Date: 9-30-05	

Task	% of Total	% of Task this quarter	% of Task to date	% of Total Complete
Lecture Series	15%	33%	100%	15%
Research Newsletter	15%	33%	66%	10%
NJDOT Annual Report	10%	80%	80%	8%
US DOT Reporting Requirements (Annual Report, Semi-Annual Report, etc…)	25%	50%	80%	20%
Publication & Distribution of Research Papers	10%	50%	60%	6%
Process Request for Proposals	15%	33%	100%	15%
Participate in Conferences	10%	50%	50%	5%
Total	100%			79%

Project Objectives:
The objectives of the Technology Transfer program are:
- To increase the awareness and level of information concerning transportation issues facing US DOT Region 2 for all within the region;
- To improve the knowledge base and approach to problem solving of the region's transportation workforce, from those operating the systems to those at the most senior levels of managing the system; by doing so, to improve the overall professional capability of the transportation workforce;
- To stimulate discussion and debate concerning the integration of new technologies into our culture, our work and our transportation systems;
- To provide the more traditional but extremely important job of dissemination of research and project reports, studies, analysis and use of tools to the education, research and practicing community;
- To provide unbiased information and testimony to decision-makers concerning regional transportation issues consistent with the UTRC theme.

Project Abstract:
The goal of the Technology Transfer Program for the New Jersey Department of Transportation is to provide research results to potential users in a form that can be directly implemented, utilized and applied to transportation operations.

1. Progress this quarter by task:

- The UTRC attended NJDOT Quarterly report meetings and a budget meeting to discuss invoices.
- The UTRC conducted a visiting seminar by Laxmi Ramasubramanian of Hunter College, "Visualizing Alternative Urban Futures: Creating Opportunities for Communication, conversation and Policy Making Using Spatial Multimedia".
- The UTRC processed NJDOT request for proposals.
- The UTRC began the USDOT Annual Report.
- The Summer newsletter was sent to the printers
- The NJDOT and UTRC are working on the NJDOT Annual Report. The UTRC is waiting for documents and review by NJDOT to finalize the report.

2. Proposed activities for next quarter by task:

- The UTRC will complete the USDOT Annual Report.
- The NJDOT Annual Report will be completed and printed

3. List of deliverables provided in this quarter by task (product date)

    NA

4. Progress on Implementation and Training Activities:

    NA

5. Problems/Proposed Solutions

Total Project Budget	$50,000
Modified Contract Amount:	$35,000 estimated
Total Project Expenditure to date	
% of Total Project Budget Expended	70%

NJDOT Bureau of Research
QUARTERLY PROGRESS REPORT

Project Title:	Identification of Traffic Control Devices for Mobile and Short Duration Work Operations	
RFP NUMBER: Project 2003-27		NJDOT RESEARCH PROJECT MANAGER: Ed Kondrath
TASK ORDER NUMBER:: RFCUNY 23-01		PRINCIPAL INVESTIGATOR: Robert E. Paaswell, Ph.D.
Project Starting Date: 01/01/04 **Original** Project Ending Date: 12/31/04 **Modified Completion Date: 8/30/05**		Period Starting Date: 7/01/05 Period Ending Date: 9/30/05

Task	% of Total	% of Task this quarter	% of Task to date	% of Total Complete
Literature Search	25%	100%	100%	25%
Task 1: Develop methodology and criteria for evaluating devices	12%	100%	100%	12%
Task 2: Analyze NJDOT practices for work zone operations	8%	100%	100%	8%
Task 3: Identify guidelines to eliminate driver inattentiveness	5%	50%	100%	5%
Task 4: Identify alternative techniques for traffic control	4%	0%	100%	4%
Task 5: Prepare guidelines	2%	0%	100%	2%
Task 6 (Mod): SHRP Presentation	10%	2%	2%	2%
Final Report and Implementation	34%	40%	50%	17%
TOTAL	100%			75%

Project Objectives:
The overall objective of this research project is to study mobile work zone safety with particular attention to the identification of work zone safety devices, information systems for the reduction of safety and congestion, and implementation of innovative techniques to reduce delays and crashes due to work zones. The specific objectives are to:

- Provide improvements for maximum protection of the motoring public and workers in the work zone and in the set up of the work zone,
- Identify state-of-the art work zone technologies to improve worker safety in mobile work zone and short term maintenance operations,
- Identify information systems for work zone traffic control to reduce delays and crashes,
- Meet the current standards established by internal policies of the NJDOT,
- Identify "best practices" for the use of law enforcement to improve work zone safety,
- Identify key issues to be considered from public outreach and information systems.

Project Abstract:
This research will include the identification of potential technologies and information systems, evaluation of the identified devices and systems with appropriate maintenance yards and crews, and the parathion of specifications and Baseline Document Change papers for adoption by the NJDOT. Potential technologies and information systems will be identified from the NJDOT New Technologies and Products database of approved and under evaluation products, Transportation Research Board and National Cooperative Highway Research Program reports, international sources, Strategic Highway Research Program reports, other State DOT correspondence, and manufacturers and vendors. The identified technologies and information systems will be researched to obtain users and technical information on their effectiveness.

1. Progress this quarter by task:

- No Progress this quarter

2. Proposed activities for next quarter by task:

- The final report will be completed to document the previous tasks reported in the working papers and the Rutgers University work.

3. List of deliverables provided in this quarter by task (product date)

    NA

4. Progress on Implementation and Training Activities
    NA

5. Problems/Proposed Solutions
    The subcontractor, Rutgers University, has not completed their task, and the UTRC is waiting for permission from NJDOT to terminate the Rutgers Contract.

Total Project Budget	$72,294
Modified Contract Amount:	
Total Project Expenditure to date	$61,450.
% of Total Project Budget Expended	85%

Project Title:	Cost of Transporting People in New Jersey – Phase 2	
RFP NUMBER:		NJDOT RESEARCH PROJECT MANAGER: Abbas Hirya
TASK ORDER NUMBER::		PRINCIPAL INVESTIGATOR: Kaan Ozbay
Project Starting Date: 1/1/05 **Original** Project Ending Date:12/31/05 **Modified Completion Date:**		Period Starting Date:5/1/05 Period Ending Date:8/31/05

Task	% of Total	% of Task this quarter	% of Task to date	% of Total Complete
Literature Search	5%%	100%	100%	5%
1. Kickoff Meeting	5%	0%	80%	4%
2. Identify Cost Models that need to be Improved and Data Availability	5%%	10%	60%	3%
3. Develop Guidelines and Mechanisms for a More Efficient Cost Database Structure	10%	10%	30%	3%
4. Enhance / Update Cost Models	30%	25%	50%	15%
5. Integration of Improved / Updated Cost Models with the Current Travel Demand Models Used by the NJDOT	30%	5%	5%	1.5%
6. Technology Transfer	10%			
Final Report	5%			
TOTAL	100%			31.5%

Project Objectives:
1. An effective and robust cost modeling tool will be developed.   This tool is useful for NJDOT planners to analyze and evaluate various scenarios and policy options. In addition, the tool will be Windows-GIS based, user-friendly and easy to use.
2. The GIS based cost modeling tool will be compatible with the existing travel demand models to assure the robustness of the model results. The novelty of the proposed cost modeling tool is in its integration with the existing travel demand models. This feature provides a dynamic approach in estimating the effect of the policy options on travel demand patterns.
3. Guidelines and mechanisms for a more efficient cost database structure will be developed because it is highly desirable to have a database structure that can be used to dynamically update the cost functions with new data, when available.
4. The costs models developed in the first phase of the project will be improved. The available data for each cost category will be determined. Since the duration of the project is not long enough to collect brand new data that is not readily available, the selection of cost categories to be updated will be based on the data availability.

As of 2/06/2004

Project Abstract:
Cost of Transporting People in New Jersey was concerned with the development of Full Marginal Cost (FMC) model specific to New Jersey. Basically, the study attempted to provide an answer to the following question: "What is the cost of an additional trip in NJ highway network?" Methodological and experimental steps followed to answer this question in Phase 1 of this project can be summarized as follows:
1. Four (4) highway transportation cost categories were determined. These were:
2. User costs (Vehicle operating, congestion, accident),
3. Infrastructure costs
4. Environmental (Air pollution and noise) costs.

Marginal cost functions of each cost category were estimated using the available local and national data. Vehicle operating, accident and infrastructure cost functions were developed using NJ specific data, whereas congestion, and environmental cost functions were developed using the available national data. One-Route Marginal Cost (ORMC) methodology was developed and coded using *Avenue* computer language. *Avenue* is an object-oriented programming language used to create user interface for **Arc-View GIS** software. ORMC methodology estimates the marginal cost of a trip between a selected origin-destination (O-D) pair along the shortest route. Estimated ORMC values for selected O-D pairs are classified based on trip distance, time of the day, highway functional type and urbanization degree. These results are presented in the Phase 1 Project report

The Phase 1 of this project was a preliminary step towards developing a "dynamic" tool for policy makers and analysts to estimate the FMC of transporting people in NJ. The methodology behind this dynamic tool differs from the traditional static approaches that have been commonly used by the government agencies. Proposed tool will be capable of capturing the relationship between the various cost categories at various demand levels for a number of roadway infrastructure properties, as they change over time. This dynamic aspect of the proposed model will allow the policy makers to determine the prevailing costs under various scenarios, and will be extremely useful in understanding the effects of different policy decisions. It should be noted that the cost functions developed specifically for this project are also useful for other applications such estimating maintenance costs and construction costs of a roadway, estimating congestion and environmental costs.

1. Progress this quarter by task:
Tasks 1 & 2: A meeting with David Schellinger of URS Greiner is on June 2nd, 2005. This meeting was the first meeting to exchange information about the output of the NJDOT planning model and the input needs of our cost models. As a result of this meeting, on July 8th, we obtained North Jersey planning model related network and dataset from NJTPA. An assessment of new data available on the NJDOT web site and other related web sites is made to determine possible improvements that can be made to the models. On July 7th, we also met with Abbas Hirya to obtain new cost related data from NJDOT intranet. We downloaded from his computer related data and we are now in the process of studying the obtained data set.

Task 3: We revisited the previously developed cost functions and worked on the development of a software structure to estimate them. We developed a software implementation plan for the individual cost functions given the network database we have obtained on July 8th. We have also tested the individual cost function using the new network data to identify possible problems.
As of 2/06/2004

Task 4: As part of this task, we devised an enhanced cost estimation approach for all the trips between each OD pair over a number of paths other than the shortest path. . This will be a major improvement over the single path cost estimation method used in the previous Phase of this project. We also met with the NJDOT project manager, Abbas Hirya, on the 25th of August and briefed him about mainly Tasks 4 and 5. We also demonstrated the modified dataset using Arc View and the software implementation of the new multi-path cost estimation method.

Task 5: As part of this task we decided to use Arc-View as the software development platform. We completed the first version of the program that computes costs over a fixed number of paths between each selected O-D pair. This is the stand-alone version (V 0.1) of the cost estimation tool. We are now working on integrating it with Arc-View. On the 25th of August meeting, we gave NJDOT project manager a technical report (memorandum) that describes our efforts and findings so far.

2. Proposed activities for next quarter by task
Task 2: Complete the meeting with NJDOT consultants namely Gary Davis of Urbitran, to understand the South Jersey network and planning model.
Task 3: Re-estimate, I needed, any of the cost functions based on the new NJDOT data.
Tasks 4 & 5: Finalize initial Arc View software implementation of the enhanced cost estimation methodology. This will be e the second version (V 0.2) of the prototype application of the cost estimation tool. Demonstrate it to NJDOT to get feedback.
Task 6 / Final Report: Prepare a technical memorandum that summarizes our findings.

3. List of deliverables provided in this quarter by task (product date)

Technical memorandum that describes our progress delivered for review on the 25th of August.

4. Progress on Implementation and Training Activities

5. Problems/Proposed Solutions
1. We received the contract from UTRC yet and started charging the project.
2. A meeting with Gary Davis of Urbitran could still not be scheduled but efforts are being made to arrange this meeting too.
3. After meeting with the NJDOT consultants, we will expedite the work on tasks 3 and 5, because the final product depends heavily on its integration with the NJ Planning mode. This is mainly due to the fact that our application will use the output from these planning models and we need to be able to integrate it with the output of the planning models.

Total Project Budget	
Modified Contract Amount:	
Total Project Expenditure to date	
% of Total Project Budget Expended	%

As of 2/06/2004

As of 2/06/2004